OHIO GROWN PERILLA.

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The Perilla plant is an indigenous Labiatae of China, Japan and India. Several varieties of *Perilla nankensis* are grown as ornamental plants. *Perilla ocimoides* is not an ornamental plant, but is grown to a large extent in Japan and China for its oil. Perilla ocimoides is a tall, rough plant with square, much branched stems, simple, ovate leaves of light green. Blooms in September. Flowers, small, white, blotched with purple, numerous, in compact spike. Seeds ripen soon after flowering. Perilla seeds are 1-16 inch in diameter, irregular, about the same color, and much resemble those of the radish. They have a pleasant, slightly sweet, oily taste. Outer surface of seed reticulated. All portions of the plant contain a volatile oil or camphor, with strong minty odor.

The seed contains a fixed oil similar in taste, odor and drying qualities to our common linseed oil. In Manchuria, this oil is used for edible purposes. In Japan, the drying qualities of the oil are utilized in waterproofing paper umbrellas, in the manufacture of paints, varnishes and lacquers, in making transparent paper for windows, and in fabricating artificial leather. Its use in manufacture of window paper is very important. Commercial name of this oil is *Yo-Goma.*

In September, 1910, U. S. Consul Sammon, at Yokahama, Japan, reported on the uses of this plant and suggested its introduction into the United States. According to this report, (Daily Trade Reports, Bureau of Manufactures, Sept. 14, 1910), the plant thrives on the sandy soils of the colder portions of Japan and China.

In Japan, 300,000 bushels are produced annually. About 20 bushels per acre is the average yield. The oil is obtained by pressing, a bushel of seed producing a gallon of oil. The oil has a ready market at 35c per *sho* or 70c per gallon. The seed sells at 10c per pound.

Following the suggestion of Mr. Sammon, we imported, direct from Japan, early in 1911, a small quantity of this seed. Seed sown in mid April on the dry, sandy upland soil of West Akron. Its growth during the following summer, indicated that it is not a drought resisting plant. The plant develops, at an early date, a strong root system made up of many fine rootlets. These roots are surface feeders and, on this account, the plant is easily affected by dry weather. On moist, clayey soil the growth was much better. Estimates made on the basis of a small area gave a yield of 400 pounds of clean seed per acre. Our crop did not fill well. Only about 80% of the seed pockets contained a

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good sound seed. Many of the seeds were light. Compared with the original Japanese seed, Ohio grown seed is fully 19% lighter in weight per equal volume.

According to Lewkowitsch (Oils, Vol. 3, p. 38), Perilla oil occurs to the extent of 36% in the nutlets of Perilla ocimoides. In our own sample of Japanese perilla, we found, by extraction with benzol, 45% oil. Ohio grown perilla from same seed, by the same method, gave 41% oil. Ohio grow perilla oil is much darker and thinner than oil of Japanese origin, and when first extracted retains the strong odor of the growing plant.

Perilla oil when exposed to warm air, drys rapidly to a film. In Japan, the boiled hot oil is applied by means of brush or cloth, to the common paper sun shades and the treated articles exposed to the sun for five hours.

The drying qualities of perilla oil is said by authorities to be inferior on account of the tendency of the oil to gather in drops during the spreading operation. We do not find this to be the case. Japanese perilla oil and linseed oil agree very closely in their spreading qualities. In their drying qualities they differ, linseed oil drying much faster. Perilla oil, however, gives a smooth film. Films are equal in toughness and strength.

With paper, duplication of Japanese umbrella test, linseed shows to the better in giving a perfectly dry coating in much shorter time than perilla. Quality of coatings practically the same. In the same test, Japanese oil gave better results than the Ohio oil. This poor showing may be due to the newness of the seed. Old flaxseed oil or tanked linseed oil dries much better than new oil. Ohio oil, however, is much more fluid than oil of Japanese origin. This, also, may be due to the presence of the natural stearopteneor perilla camphor found in the fresh plant.

Compared with flax, the crop with which it will compete, we get this data: An acre of flax yields 9 bushels or 504 pounds of seed containing 176.4 pounds (22.6 gallons) of oil, making, at 90c per gallon, an oil value of $20.34 per acre. To this must be added the returns from two valuable by-products, oil-cake and fibre.

An acre of perilla will give 400 pounds of seed containing 164 pounds (21.3 gallons) oil, making, at 70c per gallon, an oil value of $15.61 per acre. Perilla stems are worthless for fibre or fodder, and the value of the press cake for cattle food or fertilizer is unknown. It is possible that the cake residue could be directed towards a supply of bread stuff and that the essential oil or camphor could be obtained on the same lines as the peppermint oil industry. Assuming that the cost of production is the same, and that other conditions are equal, facing a loss of $4.73 per acre, it is hardly probable that this new crop will supplant flax as an Ohio crop. On the other hand, the argument presented points to the substitution of flax for perilla in Japanese agriculture and in the old opium fields of the new Chinese Republic.

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